GAS ABSTRACTS

A MONTHLY REVIEW OF CURRENT LITERATURE RELATING TO THE GAS INDUSTRY

PREPARED BY THE TECHNICAL AND LIBRARY STAFF OF THE

INSTITUTE OF GAS TECHNOLOGY

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GAS ABSTRACTS

GAS ABSTRACTS represents the inauguration of a new phase of service to the Gas Industry by the Institute of Gas Technology. For some time the library and the technical staff have been cooperating in preparing abstracts of papers appearing in technical journals for our own information. GAS ABSTRACTS is being prepared by assembling, once each month, abstracts which have been prepared in this manner.

A major advantage of this service is that it selects for the attention of our staff and the technical personnel of our member companies those articles which seem to be of immediate interest. This selection itself will be one of the greatest advantages to the survey, since it will bring pertinent technical information before the industry while it is current, making it unnecessary for each individual to attempt to cover the entire field of related literature.

The Institute of Gas Technology was established with one of its aims as the "collection and dissemination of scientific information". The collection of scientific information has resulted in the formation of a library which now comprises approximately 5,000 volumes, a large portion of which is bound periodicals. Well over one hundred scientific journals are received currently. With the publication of GAS ABSTRACTS, we now begin to fulfill the promise of disseminating information to the Gas Industry.

All papers and publications which are abstracted will be available for use in the library. Copies in the form of photostats or microfilms will be provided at cost. The scale of prices will be published in an early issue. Requests for copies should be addressed to the library.

AIR CONDITIONING

PIERCE, H.C. AN ALL-YEAR GAS AIR-CONDITIONING UNIT. *Mech. Eng.* 67, 171-174, 189, 1945 *(Mar.)*

The general construction and operation of the gas-fired Servel air-conditioning unit is described. Projected models will have cooling capacities of 3.5 and 7.5 tons of refrigeration. The 3 ton unit will have a heating capacity of 120 M. Btu. The 5 ton units will consist of two models having heating capacities of 120 and 180 M. Btu. respectively. The 7.5 ton unit will have balanced heating capacity.

Each unit consists of a steam boiler, heating coils, and an absorption refrigeration system using water vapor as a refrigerant and lithium bromide as an absorbent. Steam from the boiler is carried to heating coils during the heating season but during the summer this steam is diverted to the generator of the absorption refrigeration system. Forced air is circulated over heated or cooled coils, as needed, and then through ducts into the living quarters.

-- J. Massier

CARBON DIOXIDE

DEE, T.P. THE PARTIAL PRESSURE OF CARBON DIOXIDE OVER AQUEOUS SOLUTIONS CONTAINING CAUSTIC SODA AND SODIUM CARBONATE. *J. Soc. Chem. Ind.* 64, 1-5, 1945 *(Jan.)*

By means of an equation relating it to known equilibrium constants and activity coefficients, the vapour pressure of carbon dioxide at 20° over a solution containing 1% of caustic soda and 14.6% of sodium carbonate, has been shown to be of the order 10^{-11} atm. and therefore far too low to interfere with the scrubbing of a gas mixture intended to lower the carbon dioxide pressure to the order of 10^{-6} atm. Calculations have also been made on the dissociation of sodium carbonate in industrial steam generators, where figures are known which give the vapour pressures, but the equilibrium constants are unknown. The temperature relation between the low- and high- temperature figures is found to be of the usual type for vapour pressures.

--Author's abstract

CATALYSTS

BURFORD, W.B.III AND FRAZER, J.C. THE POISONING OF NICKEL HYDROGENATION CATALYSTS BY WATER VAPOR. *J. Am. Chem. Soc.* 67, 331-332, 1945 *(Feb.)*

Water vapor has been shown to be a poison for nickel hydrogenation catalysts, the effect beginning to be apparent at 3×10^{-4} mm. pressure of water vapor and increasing at higher partial pressures. The poisoning is reversible, the catalyst being reactivated by heating in hydrogen.

The catalyst prepared for the experiments was of small, highly active area, thus making it as sensitive to poisoning as possible. C.P. nickel pellets of 1-3 mm. diam. were etched with aqua regia to produce a mat sensitized in a stream of oxygen at 550-700°, and reduced in the catalyst chamber. The poisoning experiments were conducted on the hydrogenation of ethylene.

--C. von Fredersdorff

CHEMISTRY - ANALYSIS

MICHELL, J.H. MICROTECHNIQUE IN ORGANIC CHEMISTRY. *Can. Chem. and Process Ind. 29, 193-200, 1945 (Mar.)*

The more common micromanipulations and techniques are reviewed with the object of acquainting the reader with the methods used to reduce familiar laboratory operations to a micro scale. Included are: (1) the determination of boiling point and melting point; (2) filtration; (3) extraction; (4) sublimation; (5) distillation and micro-preparative techniques.

--S.W. Martin

COAL

APPLEBEE, H.C., THOMAS, H.H. AND TOMLINSON, T.A. THE COAL REQUIREMENTS OF THE GAS INDUSTRY. *Gas Times 42, 147-148, 1945 (Mar. 3)*

A paper presented before the Institute of Fuel Conference on the preparation and utilization of coal.

KINNEY, C.R. THE SOURCE OF METHANE EVOLVED FROM COAL ON THERMAL DECOMPOSITION. *Fuel in Science and Practice 24, 16-21, 1945 (Jan.-Feb.)*

All bituminous coals yield about identical quantities of methane when carbonized under similar conditions, regardless of their volatile matter content. This demonstrates that coals not only contain a characteristic substance, which yields large quantities of methane, but that this substance is present in approximately equal amounts in them.

Thus the "methane number" does not vary from coal to coal as do all other properties, provided that the carbonizing conditions are the same. This indicates that all coals have a common structure, and it appears that the translucent humic matter of coals is the source of the constant yield of methane.

It is also interesting to note that lignin was found to yield as much methane as peat and certain lignites two or three times as much as cellulose or carbohydrates. This is another indication that the main source of peat and coal is the lignin of plants.

--J.J. Sebastian.

SAMUELS, J.O. FLOCCULATION AND FLOTATION PRINCIPLES IN THE RECOVERY OF LOW-GRADE FUELS. *J. Inst. of Fuel, 18, 103-111, 1945 (Feb.)*

Flocculation is the increase of particle size to produce increase in sedimentation rate. Coal particles carry a negative charge, and have an adsorptive affinity for hydroxyl ions.

The author gives a resume of application of flocculation methods to coal wash slurry recovery, which in Great Britain represents 8-10 millions of tons yearly.

Flotation, which is employed more for mineral ores than for coal makes use of a bubble forming material which will carry the coal particle. Percent of coal recovered by flotation methods averages 75-85% according to the data presented.

--W. Volk

COAL

STACK, A.J. COAL SEGREGATION IN BOILER PLANTS. *J. Inst. Fuel, War time bull.* 18, 58-62, *1944 (Dec.) (Abridged from Mech. Eng.* 66, 523-28, *1944 (Aug.))*

There is a tendency for size segregation to occur whenever coal is moved. In this article the causes of coal segregation are discussed and specific examples of correct and incorrect methods of handling are well illustrated. In stoker operation the elimination of coal segregation improves the combustion efficiency, reduces maintenance, and increases the boiler capacity.

--R.T. Griffith.

COAL - ANALYSES

OCKELFORD, C.W.G. AN ELECTRICALLY HEATED FURNACE FOR THE DETERMINATION OF VOLATILE MATTER IN COAL. *Fuel* 24, 3-7, *1945 (Jan.-Feb.)*

"Constructional details are given of a furnace for use in the determination of volatile matter according to the method specified by the British Standards Institution in B.S. 1916-1942, 'Methods for the analysis and Testing of coal and coke.' "

--Author's Abstract

COAL - CARBONIZATION

BLAYDON, H.E., GIBSON, J. AND RILEY, H.L. MOLECULAR NATURE OF COKING COAL BITUMENS. *J. Inst. of Fuel,* 18, *117-129, 1945 (Feb.)*

Bituminous coals are conceived of as consisting of ulmin, humin or residual coal which is insoluble in organic solvents and the bitumen, which, while soluble, is more or less stable up to 600°C. Considerable X-ray diffraction data substantiating this hypothesis is given. The bitumen is considered to be made up of large, lamellar aromatic molecules.

The coking properties of coal, which are shown to be dependent on the presence of a particular type of lamellar aromatic molecule, may be improved by adding coal tar pitches to non coking coals.

--W. Volk

FOXWELL, G.E. THE CARBONIZING INDUSTRIES AFTER THE WAR. *Gas Journal* 245, *273-275, (Feb. 28)*

The author anticipates stringent smoke prohibition in England after the war. Carbonization is the only known method of making smokeless fuel from bituminous coal.

Coke is manufactured by both the Gas Industry and coke oven operators. In as much as the gas undertakings come under government supervision, the author points out the advantage of government supervision of coke oven operators. No operating details are given, but the discussion is to be continued in later issues.

--W. Volk

COAL - CARBONIZATION

LOW TEMPERATURE COKE AS AN AID TO HIGH-TEMPERATURE CARBONIZATION. *Coke & Smokeless-Fuel Age* 7, 31-33, *1945 (Feb.)*

The use of low temperature brown-coal coke, as a thinning agent for coking and high volatile coals in high temperature carbonization, has been investigated at the Bergakademie in Clausthal and on a large scale in the coking plant at Dahlhausen. The semi-coke was blended with Ruhr coal from Minister Stein colliery. Complete experimental results are shown.
Up to 30% of semi-coke mixed with the raw coal, gave a higher proportion of coke over 45 mm. than with raw coal alone, and up to 22% had no effect on the amount of breeze formed. The above results were obtained on narrow ovens and rapid heating - 20mm. per hour. Such an operation is considered highly promising and capable of repetition on a large scale in the narrow Koppers' ovens.
In 1941 a rotary low temperature retort designed by F. Winkler was used on the Saar region coal, effecting semi-carbonization of coal at 550°C. Even when using weakly-coking, coals, closely grained, small semi-coke with a volatile content of 10-12% and suitable for blending with coal was produced. This process was being tried on a large scale in 1942 and plans for the erection of a 150 ton plant were drawn up.

--A.D. Singh.

COAL - GASIFICATION

KING, J.G. THE COMPLETE GASIFICATION OF COAL: THERMAL CONSIDERATIONS. *Gas Times* 42, *Suppl. V, 1945 (Mar.3) Gas World* 122, *220-226, 1945 (Mar.10)*

The thermal efficiency of the various gas making processes is defined as the percentage which the thermal value of the products bears to sum of thermal values of the raw materials used and of the heat and power consumed. However, in discussing the various gasification processes used in Britain and in Germany, the thermal values of the by-products, such as tar, benzene, and phenols, are disregarded, and by "efficiency" is taken the percent ratio of the thermal value of the gas produced to the total heat input as defined above.
The thermal efficiency can best be increased by a study of the heat of the reactions involved, and potential and sensible heats of the products made. In a thermally efficient process it is necessary to keep the CO_2 formed to a minimum, to reduce radiation losses, and to return the sensible heat of the product to the system. Heat balances are given for various gasification processes. Critical analysis of these heat balances suggests methods of increasing the thermal efficiency of individual processes. The maximum efficiencies at present possible are, for Producer Gas 70.1%; Carburetted water gas 64.5%; Tully process (blue gas generators connected in series, the up-run gases being passed downwards through the next generator) 56.6%; Lurgi process 62.2%; Winkler process 77%; Didier-Bubiag process 68.7%; Thysson-Galocsy process 90% (including recovery of tar).

--J.J.S. Sebastian

COAL - PREPARATION

INSTITUTE OF FUEL. COMMITTEE ON COAL PREPARATION. COAL PREPARATION. *Colliery Guardian* 170, 382-386, 1945 (Mar.23) *J. Inst. Fuel* 18, 94-98, 1945 (Apr.)

The problems in cleaning coal are taken up together with the rationalization of markets according to location of consumer premises and the use to which the coal will be put. Then the costs of froth filtration and water clarification are evaluated and the actual range of expenditure in preparing coal for market is estimated at 33 to 50 cents per ton and raw coal according to the amount of hand-picking and handling involved. The total cost of cleaning is summarized as: (1) actual capital and operating costs of preparation plant; (2) size degradation due to handling and: (3) loss of vend.

--J.F.Schnacky

COAL, PULVERIZED

BRIDGWATER, R.M. BRITISH RESEARCH ON PETROLEUM SUBSTITUTES. II. DIRECT REPLACEMENT: PULVERIZED COAL. *Petroleum* 7, 211, 1944 (Dec.)

Replacement of oil by pulverized coal is discussed. For use in Diesel engines the difficulties encountered were: (1) Proper method of injection of fuel; (2) variations in the reactivities of coals; (3) excessive wear of the cylinders and pistons. Coal divided as finely as possible and a precombustion chamber for each cylinder might obviate these difficulties. Wear is due primarily to the formation of a paste of ash, carbon and a film of lubricant on the cylinder walls. Results of wear tests show that excess wear could be avoided by (a) choice of proper coal; (b) removal of the maximum amount of ash by cleaning: (c) fine grinding of coal; (d) selection of suitable metals. Efficiency in use of pulverized brown coal reported in Germany is 80% that obtained by the use of oil.

--C. von Fredersdorff

COAL TAR

COOK, J.W. AND PERCY, NATHANIEL. THE ISOLATION OF 1:12-BENZPERYLENE FROM COAL-TAR PITCH. *J. Soc. Chem. Ind.* 64, 27-28, 1945 (Jan.)

'The highest boiling fraction of coal-tar pitch consists of an orange-red brittle resin which appears to be of very mixed composition. By the application of chromatography and fractional crystallization of molecular compounds with picric acid and s-trinitrobenzene there was isolated from this resin a small amount of 1:12-benzperylene.

--Author's abstract

DUST

BROWN, H.R. INDUSTRIAL-DUST EXPLOSIONS. *U.S. Bureau of Mines. I.C. 7309, Jan. 1945.*

A general review of the subject and a preliminary report on extensive experiments that have been carried out investigating the factors controlling dust explosions.

--G.D. Creelman

EDUCATION, TECHNICAL

HULL, A.W. SELECTION AND TRAINING STUDENTS FOR INDUSTRIAL RESEARCH. *Science* 101, 157-160, 1945 (Feb. 16)

"The qualities which are needed for success in industrial research may be classed in four groups. They are, in order of importance, character, aptitude for research, attitude toward work, and knowledge. ... Should not they be so rated in the educational program?" Dr. Hull of General Electric Co.' Research Laboratory discusses education from this viewpoint.

--Excerpt from article

ELECTROCHEMISTRY

WITTENBERG, R.B. ECONOMIC FACTORS AFFECTING ELECTROCHEMICAL INDUSTRIES. *Chem. and Met. Eng.* 52, 103-106, 1945 (Mar.)

Products now made by electrochemical operations are mainly basic industrial materials. The author points out that in the next decade we may confidently expect electrochemistry to move into more complex fields such as organic oxidation and reduction and provide the means for more readily producing new materials and at a lower cost.

--Editors' Abstract.

ELECTRON MICROSCOPE

BRUBAKER, D.G. LIGHT AND ELECTRON MICROSCOPY OF PIGMENTS. *Ind. and Eng. Chem. Anal Ed.* 17, 184-187, 1945 (Mar.)

A dispersion of zinc oxide was examined in the microscope and the electron microscope. Then the micrographs were compared. The improved resolving power of the electron microscope is clearly demonstrated in determining both the shape and particle size distributions of fine pigmentary powders.

--S.W. Martin

EXPLOSIVES

HUFF, W.J. STUDIES ON EXPLOSIVES AND EXPLOSIONS, FISCAL YEAR 1944. *U.S. Bureau of Mines. R.I. 3794, Jan. 1945.*

Review of the year's progress with explosives and explosions. There are two sections of interest; (1) Inflammability of various solvents and anesthetics; (2) Anthracite mine fires. (Review of *Bureau of Mines Bul. 455, 1944.)* Summary of 5 years experimental work.

--G.D. Creelman

FLUID FLOW

CLINEDINST, W. O. FLOW EQUATIONS FOR GAS CONSIDERING DEVIATIONS FROM IDEAL GAS LAWS. *Am. Gas J.* 162, 12-20, 1945 (Mar.)

FLUID FLOW

KROLL, A.E. GRAPHICAL SOLUTION OF FRICTION LOSS PROBLEMS IN FLUID FLOW. *Chem. and Met. Eng.* 52, 110-111, 1945 (Mar.)

A set of curves, based on friction data, were drawn with the volumetric flow rate as ordinate, head loss per 1,000 ft. of clean steel pipe as abscissa, and pipe diameter as parameter. Knowing the first and third items, the second could be calculated, but the result holds only for water or a liquid of kinematic viscosity approximating 1.1 centistokes. A second graph provides a viscosity correction factor, and a table is to be consulted for roughness factors.

--J.D. Parent

WILDE, H. THE EQUILIBRIUM CONDITION OF MANOMETERS OF THE RING BALANCE TYPE. *Engineers' Digest* 2, 194-196, 1945 (Apr.) (From *VDI Zeitschrift*, 83, 1944, Mar.)

The author compares two different explanations as to how the ring balance type of manometer functions. The one favored is that rotation of the ring attending a difference in pressure on the two sides is due to displacement of the center of gravity of the manometric liquid contained in the ring.

—J.D. Parent

WILSON, W.E. TRANSPORTATION OF SUSPENDED SOLIDS IN PIPE LINES. *Mining Technology.* 9, T.P. 1785, 1945 (Mar.)

Dr. Wilson has made use of a suggestion of Professor O'Brien of the University of California that the friction work per lb. of dry material should be considered in determining the relative efficiency of various installations. The author shows that the work done per unit weight of solids per unit length of pipe equals the slope of the energy grade line divided by the ratio of the mass of suspended solids to the total mass of the mixture. Since this quantity is to be a minimum, the term in the numerator should be a minimum or the term in the denominator should be a maximum. The ratio of solids to mixture (or solids concentration) cannot be increased indefinitely without causing clogging. This, of course, depends on the actual stream velocity, size distribution and density of the solid particles. Large channel diameter and high solid concentration contribute to a reduction in the energy required per unit weight of solids.

--J.D. Parent

FRACTIONATION

KITCHENS, W. FILTROL FRACTIONATION. *World Petroleum* 16, 54-55, 1945 (Mar.)

The Filtrol Company has developed a process which combines distillation and adsorption decolorization in an integrated operation. The process consists in heating the lubricating oil fraction up to about 650°F in a preheater in the presence of decolorizing earth. The treated oil is then flashed into a vacuum distillation tower and the unvaporized portion (bright stock) is subjected to further soaking at a lower temperature in the base of the tower. The spent clay is removed on a rotary filter from the bright stock. The overhead fractions (neutral oils) are taken off at appropriate trays in the tower. Lower clay consumption savings in labor and equipment and lower oil losses in the filter cake are claimed.

--C.H. Riesz

FRACTIONATION

McREYNOLDS, E.E. NEW METHOD FOR EQUILIBRIUM VAPORIZATION CALCULATION. *Petroleum Refiner 24, 85-91, 1945 (Mar.)*

"The method presented is a time and labor-saving device for calculations involving equilibrium vaporization of mixtures for which the "K" values of the components are known. This new method eliminates trial and error, and from one to three calculations for each component and summations." Quotation from text.

PATRICK, G. IMPROVED STILL-HEAD DESIGNS FOR LABORATORY FRACTIONATING COLUMNS. *Chem. and Ind. 64, 74-75, 1945 (Mar.10)*

Distillate take-off from a total condensation head is effected by a variable orifice. The orifice opening is changed by raising or lowering a pool of mercury. Two designs are presented. 19 references.

--C.H. Riesz

TODD, F. EFFICIENT AND VERSATILE LABORATORY FRACTIONATION COLUMN ASSEMBLY. *Ind. and Eng. Chem: Anal ed. 17, 175-181, 1945 (Mar.)*

Description and performance of a laboratory fractionation unit is given. Unique features of the design are: (a) the pot heater; (b) the regulation of thermal gradient to obtain adiabatic conditions; (c) ease of assembly and; (d) interchangeability of column parts. Sixty nine references.

--C.H. Riesz

FUEL, COLLOIDAL

BRIDGWATER, R.M. BRITISH RESEARCH ON PETROLEUM SUBSTITUTES. PT. 3 - COLLOIDAL FUEL. *Petroleum 8, 2-4, 1945 (Jan.)*

The theory and practice of colloidal fuel is discussed. Since coal is less expensive on a thermal basis than oil, a suspension of finely pulverized coal in oil combines the useful features of the two fuels. Coal in about 50:50 coal-oil mixture is more closely packed than it is in dry, pulverized fuel. Thus storage space is used to better advantage. A shallow layer of water above the mixture is sufficient to prevent spontaneous combustion.

The term "colloidal fuel" is not strictly correct, although commonly used in practice. The size of the particles, ranging from 1 to 64 micron (or 0.000,04-0.002,5 in.) is considerably above the true colloid size of max. 0.1 micron. The size to which coal can be ground without the cost of grinding becoming so high as to be uneconomical, is that used for pulverized fuel, i.e., 80-90 % through a 240 mesh sieve. This corresponds to a max. size of about 0.0025 in. The stability of colloidal fuel may be increased (1) by reduction of particle size, which is uneconomical at present; (2) by addition of a chemical stabilizer which confers a gel structure on the oil, such as certain soaps; (3) by addition of an agent which peptizes the coal; and (4) by the choice of suitable oils for the purpose of forming stable suspensions. However, it has been shown that neither the oil nor the coal is changed in chemical or physical properties as a result of being made into the suspension.

J.J. Sebastian

FUELS, COMPARATIVE

BRIDGWATER, R.M. BRITISH RESEARCH ON PETROLEUM SUBSTITUTES. I. BASIC MATERIALS *Petroleum 7, 200-202, 1944 (Nov.)*

British researches on the production of substitutes for petroleum and its products, such as lubricating oils, liquid fuels, solvents, etc. prior to the war are discussed. Since it is expected that imports to Britain will be restricted during the post-war period, indigenous fuels will have to be used as natural sources of producing substitutes for petroleum products. Among these, peats, natural gas, coals and anthracite should be mentioned. The merits of each of these sources are discussed in detail, particularly the various types of coals available in Britain. The properties of various solid fuels, such as wood, peat, lignite, bituminous coals, semi-bituminous coals and anthracites are shown in a tabulated form.

— J.J. Sebastian

FUELS, SYNTHETIC

FIELDNER, A.C. AND FISHER, P.L. BIBLIOGRAPHY OF BUREAU OF MINES INVESTIGATIONS ON THE PRODUCTION OF LIQUID FUELS FROM OIL SHALE, COAL, LIGNITE AND NATURAL GAS. *U.S. Bureau of Mines. I.C. 7304, Jan. 1945.*

FURNACES

CHRISTIE, A.G. POSSIBILITIES OF THE PRESSURIZED BOILER FURNACE. *Power Plant Eng. 49, 130-134, 1945 (Mar.)*

Over all efficiencies of boiler furnaces employed in present practice have about reached practical limits. Further lowering of final flue gas temperature is not likely. Developments indicate possibilities of smaller furnaces and reduced weights of metals in boilers, through higher rates of combustion in pressurized furnaces and forced boiler water circulation. Lower first cost of unit is a possibility.

—Author's abstract

COKE CONSUMPTION IN BLAST FURNACES. *Coke & Smokeless-Fuel Age 7, 57-58, 1945 (March)*

The highlights of Dr. Colclough's paper presented to the Iron and Steel Institute (England) with some passages from J.E. Johnson's book "The principles, operation and products of the blast furnace" (1918) are given to show the similarity of the two proposals. In general, to obtain low coke consumption: (1) No lump of ore should be above a certain limiting maximum size; (2) the ore should be uniform in size to prevent irregularities in the gas flow; (3) the composition of the materials over each part of the cross sectional area of the furnace should be uniform to secure uniformity in heat requirements.

--V. de Marchi

GAS, NATURAL - MEASUREMENT

SHAW, T.C. PROBLEMS IN MEASUREMENT OF WET GAS. *American Gas Jl. 162, 19-21, 1944 (Feb.); Petroleum Refiner 24, 99-103, 1945 (Mar.)*

A general discussion of errors in measurement of gas from condensate wells, or gas of similar composition, due to uncertainty regarding the density of the fluid passing through the orifice, pulsating flow, deviation of the gas from ideality, and accumulation of liquid behind orifice plates.

--B. Miller

GAS, NATURAL - TRANSMISSION

HAMMERSCHMIDT, E.G. CONTROL OF COMPRESSOR COOLING WATER. *Petroleum Engr. 16, 192-198, 1945 (Mar.)*

The network of natural gas transmission lines throughout the nation requires that compressor stations be erected at reasonably regular intervals along the route. Eacn station requires some cooling medium for engine jackets and cooling coils, and, in most cases the cooling medium is water. When the water supply is scarce, it is necessary to conserve as much as possible by recycling the water until it becomes so concentrated by evaporation that it must be discarded to prevent scale deposition. The proper concentration is maintained by some method of blowdown, preferably of the continuous type.

--Excerpt from article

SANDERS, P.V. CORRECTING PROBLEMS CAUSED BY SCALE AND CORROSION IN COMPRESSOR STATIONS. *Petroleum Engr. 16, 208-212, 1945 (Mar.)*

Bacteria, gases, dust and algae no longer need be allowed to destroy maximum effiency in compressor stations.

--Editor's abstract

GAS AND OIL ENGINES

BOYER, R.L. NEW GAS-OIL ENGINE DEVELOPED *Gas 21, 42-45, 1945 (Mar.); Gas Age 95, 40-42, 1945 (Mar. 22); Iron Age 155, 61, 1945 (Mar. 29); Oil & Gas Jl. 43, 88-93, 1945 (Mar. 24)*

The Diesel engine has long been recognized as the most efficient means of transforming the heat in a fuel into mechanical work. Originally invented by Rudolph Diesel to burn powdered coal, the compression-ignition engine has reached a high stage of development, but it has been restricted to liquid fuels of good quality because of the necessity of injecting the fuel into the cylinder at the instant when the pressure was at a maximum. The Cooper-Bessemer Company has been working since 1927 to perfect an engine in which the gas-air mixture could be compressed together without premature ignition. With the present announcement, the use of natural gas as a power fuel becomes very attractive, particularly when interchangeability with oil is economically desirable.

--J.I. Yellott

GAS APPLIANCES - IGNITION SYSTEMS

FLINT, K.H. AUTOMATIC IGNITION OF DOMESTIC APPLIANCES. *Gas Age 95, 35-39, 1945 (Mar. 22)*

Fundamental principles underlying automatic ignition of gases by means of flash tubes and hot wire coil igniters are presented. Relationship between various flash-tube design factors are reviewed. Suggested design elements evaluated from experimental data that afford a basis for satisfactory design of ignition systems are shown. Factors of coil design are analyzed including composition and size of wire, surface area, coil spacing and coil diameter. Longevity of various types of coil igniters under varied operating conditions is discussed.

--Author's abstract

GAS BURNERS

HESS, F. O. HIGH SPEED GAS HEATING TECHNIQUE. *Amer. Gas Assoc. Monthly* 27, *137-139, 1945 (Mar.)*

The influence of conductivity on rate of heat penetration is shown for cases of a few billets. The influences of conductivity requires scrutiny because different alloys will produce different temperature differentials, and therefore, affect the rate of heat penetration. This rate of penetration in turn influences the hardness. A suggestion for further work was the investigation of adding alloys for heating rates somewhat as is already done for such ultimate effects as hardness, tensile strength, quenching rates, etc.

--J. Massier

KOCH, A.H. APPLICATION OF BURNER EQUIPMENT TO FURNACES. *Gas Age* 95, *22-23, 1945 (Mar.8)*

Under peace time economy, the selection of the source of heat or kind of fuel for heat-treating furnaces will be governed, primarily, by production costs. In order to calculate heating costs, charts, tables and formulas are presented for determining heat losses from such furnaces at various operating temperatures, From these data burner sizes and gas rates can be readily determined.

--J. Massier

GAS INDUSTRY

PARKER, L.T. REVIEW OF 1944 HIGHER COURT DECISIONS OF IMPORTANCE TO OIL AND GAS PRODUCERS. *Petroleum Engr.* 16, *83-84, 1945 (Mar.)*

An expert lists cases arising from oil and gas disputes and interprets their effect on the industry.

--Editor's abstract

GAS INDUSTRY - ECONOMICS

BROWN, T. HOUSING DEVELOPMENTS AND THE GAS INDUSTRY. *Gas Journal* 245, *246-253, 1945 (Feb. 21)*

CAMERON, R.C. EVALUATING THE POST WAR MARKET FOR HEATING AND AIR CONDITIONING. *Gas* 21, *13-17, 1945 (Mar.)*

GAS MANUFACTURE

BARRITT, R.J. THE BEIMANN MAIN. *Coke and Smokeless Fuel Age* 7, *25-28, 1945 (Feb.)*

The Beimann main was originally evolved as a device for equalizing the gas pressure over a group of oven chamber or coke ovens. The gas off-take pipes of oven chambers or coke ovens is usually located at the ram end. It is evident that for a high rate of gas evolution such as takes place at the beginning of the carbonizing period, the gas off-take pipe may prove to be a bottleneck. This entails a higher pressure in the oven to drive the gas through the off-take pipe and may cause leaking

doors during the first hour or so after charging, a smokey chimney due to some of the gases passing through the walls into the heating flues, and an evolution of smoke during charging, even through the steam injector in the off-take pipe is wide open.
The Beimann main, located at the opposite end from the gas off-take pipe, serves to connect one chamber or oven with another, but not for taking away the gases. The pressure in the chambers or ovens at different stages of carbonization is equalized by the gases from the chambers or ovens, which are in the earlier stages of carbonization not being drawn off directly into the hydraulic main, but passing through the Beimann main into those chambers or ovens which are in the later carbonizing stages. Data given shows a pressure fluctuation of 1 mm. over entire carbonizing period indicating that the battery functioning as a whole has ample gas off-take area as long as the post-charging pressure peak was spread over the battery as a whole and not imposed upon single ascension pipes. On a small battery of 18 ovens it was impossible to reduce the coking time below 22 hours without the formation of excessive roof carbon. Installation of a Beimann main eliminated the roof carbon and allowed the coking time to be reduced to 18 hours. No change had been made in the coal carbonized.

--L. J.Willien

GAS MANUFACTURE

GALLAHER, P.E. RETORT HOUSE CHEMICAL CONTROL. *Gas Times, 42, 40-42, 1945 (Jan.20)*

A discussion of chemical control operations in the retort houses of Woodall-Duckham small gasworks. The duties of the chemist are outlined under the headings of (1) temperature control, (2) daily routine, (3) non-routine work, and (4) experimental work. Finally the author discusses the value of efficiency in such control, citing examples of actual improvement which resulted.

MEETING PEAK LOAD DEMANDS. *Gas age 95, 23-25, 1945 (Mar.22)*

Consolidated Edison Company's expanded gas production program results in large increase in output by emergency operation of plants for temporary period of maximum demand.

POSTLES, J.V. GAS WORKS INSTALLS WATER GAS SETS. *A.G.A. Monthly 27, 187, 1945 (Apr.)*

Description of Philadelphia's two new mechanical grate water gas sets with waste heat boilers. Tells of their aid to wartime Philadelphia.

SIMON-CARVES, LTD. ELECTPOSTATIC TAR PRECIPITATION; PLANT AT ST. HELENS GAS WORKS. *Gas Journal 245, 371-374, 1945 (Mar. 21)*

Over 2 grains of tar per 100 cubic feet of gas will foul ammonia scrubbers and purifier boxes. A large portion of the tar fog particles are under 10 microns in diameter, most of which can not be separated mechanically, but can be separated by an electrostatic precipitator whose

operation is independent of particle size. The fundamentals of the process are presented, and the treaters and electrical equipment of the Simon-Carves tar precipitator at St. Helens are described in detail. The effect of electrostatic tar removal on subsequent gas works processes may be noted by: (1) the absence of tar deposits; (2) production of tar-free sulphate crystals; (3) reduced carry over of acid from saturators; (4) cleaner operation of boosters and exhausters where these follow precipitators.

--J.F. Schnacky

GAS MANUFACTURE - BY-PRODUCTS

QVARFORT, S. AND STROMBERG, B. NEW BY-PRODUCTS AND THEIR RECOVERY AT STOCKHOLM GASWORKS. *Gas times* 42, 26-28, 1945 (Mar.3)

"Reported *in Svenska Gasverksforeningens, Arsbok, 1941, Pt. 2, pp. 35-45; and in Gas und Wasserfach,* 86, 108-110, 1943."

GAS RANGES

STOVE OUTLOOK FOR 1945. A FORECAST ON STOVE PRODUCTION, PRICING AND RATIONING DURING THE FIRST HALF OF THE CURRENT YEAR. *Gas Age* 95, 34-36, 1945 (Apr.5)

GASES - ANALYSIS

BERL, E., BERL, W.G. AND STERBUTZEL, G.A. THERMOBAROMETER. *Ind. and Eng. Chem. Anal. ed.* 17, 166-68, 1945 (Mar.)

In many gas analytical determinations (for example the Lunge nitrometer) a gaseous volume is obtained as the end-product of the analysis. In such cases it becomes necessary to convert the obtained volumes to standard conditions. A simple thermobarometer is presented which gives the proper factor correctings for temperature, barometric pressure and confining solution. A nomograph and a number of conversion factors are included in the paper. The advantage over other compensators is that only one thermobarometer is needed for an entire battery of gas burets using identical confining solutions.

--C.H. Riesz.

GASES - EXPLOSIVE LIMITS

JONES, G.W. AND KENNEDY, R.E. EFFECT OF PRESSURE ON IGNITION TEMPERATURE OF ACETYLENE AND ACETYLENE-AIR MIXTURES. *U.S. Bureau of Mines. R.I, 3809, 1945 (Mar.)*

GASES - INDUSTRIAL APPLICATIONS

PEARSON, B.M. THE LARGE SCALE GLASS INDUSTRY AND GAS FIRING METHODS. IN 2 PARTS. *Gas Times* 42, *pp. 26-28, 20-23, 1945 (Mar.31, April 14)*

GASES - STANDARDIZATION

GEYER, H.W. EFFECT ON APPLIANCE OPERATIONS OF VARIATIONS IN THE GAS SUPPLY. *Gas Age* 94, 25-32, 1944 (Dec. 14)

The effect of competition on gas appliance development is briefly mentioned. The work of the American Gas Association is reviewed and recommendations are presented for standardization of gases so that the development of home appliances can proceed on a less restricted basis with respect to the variety of gases to be utilized by them. The effects of such variations in gas supply as heating value, specific gravity, delivery pressure, percentage of inert gases, chemical composition, dust, sulfur and gum on gas appliances are briefly outlined.

--J. Massier

GASOLINE

DEAN, E.W., WILLIAMS, A.A., FISHER, N.E. OPERATING PROCEDURE FOR DETERMINING HEAT OF COMBUSTION OF GASOLINE. *Petroleum Refiner* 24, 125-126, 1945 (Mar.)

The paper ... describes details of operating procedure for determining the heat of combustion of gasoline. The degree of precision and the economy of conducting the tests compare favorably with those possible for petroleum products with low volatility.

--Author's abstract

HEATING

MUELLER, H.P. PROGRESS IN THE WARM AIR HEATING AND AIR CONDITIONING INDUSTRY. *Gas Appliance Merchandising* 17, 7-8, 15, 1945 (Mar.)

A general review of the progress in the warm air heating and air conditioning industry especially of the last year. Mr. Mueller also gives his solutions to some of the difficulties that have proven stumbling blocks to the industry during this period.

HEATING, HOUSE

HENRY, H.M. FACTORS RELATING TO ECONOMICS OF HOUSE HEATING. IN FOUR PARTS. *Cas Age* 95, 23-26, 1945 (Apr.5) *A.G.A. Monthly* 27, 155-157, 1945 (Apr.)

"This study presents certain fundamentals which should be considered in a study of the Economics of Heating and the selection of the most economical gas production methods for supplying the heating load. It will be presented in four parts in succeeding issues of Gas Age.

"Part I. in this issue, deals with the development of a simple formula for the determination of the overall unit cost per Mcf of making gas for different load factor conditions. This formula enables a quick determination of that "load factor" at which one gas process is the more economical.

"Part II will present a comprehensive analysis of the load characteristics of the heating load. This study brings out the relation of the annual load to certain portions of the daily peaks. A basis for determining the load factor at different segments and blocks of the daily peak is given. Case studies for several areas of the U.S. are included.

"Part III will give an application study of the formula developed in Part I and the load characteristics of Part II. This study shows how to apply the data of Part I and II.

"Part IV. In this section a typical gas company will be used to show the

application of the fundamental factors (previously developed and discussed) to actual company conditions. The investments for the most economical processes are developed for 10 per cent saturation of house heating. This part of the report advances the study another step in the overall consideration of the economics of heating."

--Editor's Abstract

HYDROCARBON SYNTHESIS

PEARLSON, W.H. AND SIMONS, J.H. THE MECHANISM OF THE HYDROGEN FLUORIDE CATALYZED ALKYLATION OF TOLUENE BY T-BUTYL CHLORIDE. *Jl. of the Amer. Chem. Soc.* 67, 352-362, 1945 (Mar.)

The mechanism of alkylation reactions is studied in a refined apparatus for more precise measurements. Toluene and t-butyl chloride were reacted in the presence of hydrogen fluoride and basic promoters, such as water, methanol, diethylether and hexamethylacetone were used. The base promoted reaction as the essential mechanism was found to be satisfactory from kinetic considerations and energy considerations. Mechanisms involving free radicals or ions as intermediates were discarded as untenable.

--F. Lister

HYDROCARBONS - ANALYSIS

TOOKE, J.W. AND ROBERTS, R.P. DETERMINATION OF THE COMPOSITION OF COMMERCIAL ISOBUTANE. *Oil and Gas Jl.* 43, 93-104, 1945 (Apr. 7).

A rapid method of analyzing mixtures of propane, isobutane, normal butane and pentane is based upon determining an empirical boiling point curve in an apparatus of prescribed design. Corrected temperatures for the 10, 20 and 50 points and the end point of the distillation are determined and amounts of propane, isobutane and pentane are read from empirical plots. Normal butane is then determined by difference. Accuracy is ± 1.0% for the two butanes. The test may be completed in 45 minutes.

--C.H. Riesz.

HYDROCARBONS - PHYSICAL PROPERTIES

PITTSBURGH-DES MOINES STEEL CO. THE STORAGE OF BUTADIENE AND ISOBUTYLENE. *Petroleum Engr.* 16, 85-91, 1945 (Mar.)

For more detailed information see this Company's bulletins on butadiene, isobutylene, and on the physical properties of the two. Also see GAS ABSTRACTS for April, 1945, for abstract of paper on ISOBUTYLENE.

HYDROCARBONS - THERMAL DATA

PROSEN, E.J., GILMONT, ROGER AND ROSSINI, F. D. HEATS OF COMBUSTION OF BENZENE, O-XYLENE, M-XYLENE, P-XYLENE, N-PROPYLBENZENE AND STYRENE. *Jl. of Research of the N.B.S.* 34, 65-71, 1945 (Jan.)

The following values of the heats of combustion of liquid hydrocarbons in gaseous oxygen to liquid H_2O and gaseous CO_2 were found from calorimetric experiments at 25°C and constant pressure (Figures in Kcal./mol).

Benzene	780.98	m-Xylene	1087.92
Toluene	934.50	p-xylene	1088.16
Ethylbenzene	1091.03	n-Propylbenzene	1247.19
o-Xylene	1088.16	Styrene	1050.40

--E. Lype

HYDROGEN

THE PRODUCTION OF HYDROGEN. *Coke and Smokeless Fuel Age* 7, 8-11, *1945 (Jan.)*

This is a review of various commercial processes involving the production and industrial uses of hydrogen. The processes of production reviewed are: those from water gas; the steam-iron process; that of electrolysis of caustic soda and of the electrolysis of brine. There is included a discussion of the use of hydrogen in the production of methyl alcohol.

--J.J. Sebastian

HYDROGEN FLUORIDE

SAYERS, R.R. AND DAVENPORT, S.J. THE HAZARD OF HYDROGEN FLUORIDE POISONING IN THE MINERAL AND ALLIED INDUSTRIES. *U.S. Bureau of Mines. I.C. 7311, 1945 (Mar.)*

HYDROGENATION

SMITH, H.A., ALDERMAN, D.M. AND NADIG, F.W. THE CATALYTIC HYDROGENATION OF THE BENZENE NUCLEUS. I. THE HYDROGENATION OF PHENYL-SUBSTITUTED ALIPHATIC ACIDS.
SMITH, H.A. AND PENNEKAMP, E.F.H. THE CATALYTIC HYDROGENATION OF THE BENZENE NUCLEUS. II. THE HYDROGENATION OF BENZENE AND MONO-AKLYLBENZENES. III. THE HYDROGENATION OF POLYMETHYLBENZENES. *Jl. Amer. Chem. Soc.* 67, *272-281, 1945 (Feb.)*

The objective of the publication is described as the determination of the effect of structure on the rate of hydrogenation in the benzene nucleus. The authors established that the rate was first order with respect to hydrogen pressure, zero order with respect to concentration of the benzene derivative and directly proportional to the amount of catalyst used. Factors influencing the relative rates of the hydrogenation are assumed to be two types of steric hindrance: (1) steric hindrance between the catalyst and the absorbed molecules; (2) steric hindrance which interferes with the approach of hydrogen molecules to the surface of the catalyst.

--F. Lister

INSTRUMENTATION

CRONE, H.G. AUTOMATIC COMBUSTION CONTROL FOR BOILER PLANT. *B.C.U.R.A. Monthly bulletin* 9, *65-69, 1945 (Mar.)*

Long bibliography on automatic combustion control given at end of article.

FELLER, E.W. MEASURING AND CONTROLLING LIQUID LEVEL. *Power* 89, *219-242, 1945 (April)*

The control of liquid level is of tremendous importance in many chemical operations. Ranging from the simple float-type controller, represented in many domestic installations, through the complicated preacting multi-element types, the article presents a very comprehensive description of the various kinds of automatic control

equipment by which liquid level can be regulated. The article is illustrated throughout by excellent colored drawings, and it presents much material which is new and has not appeared in earlier publications. Adaptions of the instruments described in the article will undoubtedly be applied to fluidization processes, and to other new chemical engineering activities.

--J.I.Yellott

INSTRUMENTATION

MIDDEL, H.D. SOME RECENT APPLICATIONS OF ELECTRONICS TO INDUSTRIAL PROCESS INSTRUMENTATION. *Instruments* 18, 144-148, 1945 (Mar.)

The application of electron tubes to industrial measurement and control is one of the most useful developments of the electrical industry, and one from which the gas industry should profit immensely. Ingenious adaptions of simple electronic principles have made possible the accurate measurement and recording of all important process variables, such as pressure, temperature, pH, etc. In this review of recent developments, the author discusses briefly a number of subjects of great importance to gas production and utilization. Among these are various methods of gas analysis, spectrophotometers, hydrogen-ion concentration, flow, temperature, etc. Pressure, both absolute and differential, is particularly adapted to electrical measurement, and telemetering devices are mentioned by which remote indications can be obtained at literally any distance from the primary element. Gas density, temperature, flow, and other process variables can be measured and controlled by electronic instruments which are superhuman in their accuracy and reliability.

--J.I. Yellott

INSULATION - GLASS

GLASS FIBERS FOR INSULATION. *Heating and Ventilating* 42, 59-61, 1945 (Mar.)

LIGNITE

YANCY, H.F. AND GEER, M.R. PREPARATION TESTS OF LIGNITE FROM A DEPOSIT NEAR TOLEDO, LEWIS COUNTY, WASHINGTON. *U.S. Bureau of Mines. R.I. 3795 Jan. 1945.*

"This report represents the results of work done by the Bureau of Mines in cooperation with the College of Mines, University of Washington." It is estimated that 500-1000 tons per day of lignite could be produced at less than $1.00 per ton. The deposit is about 50 miles south of Tacoma, Washington.

--G.D. Creelman

L P-GAS

ANDERSON, K.B. LIQUEFIED PETROLEUM GAS AS A STANDBY FUEL. *Gas* 21, 23-24, 1945 (Apr.)

A brief description is given of a butane-air plant which is used as a standby for natural gas. In the present form the plant consists of a 25000 gallon liquid butane storage tank, three direct fired vaporizer units, and several venturi inspirators adjusted to make 1650 Btu. butane-air and discharge them directly into the mains against 5 lbs. back pressure. A Connelly Iron Sponge "Caloroptic" is used to check the heat

value continuously, and a group of typical appliances adjusted for the regular natural gas supply are operated at the butane-air plant to give the operator a continuous check on the interchangeability of the mixture he is producing. Here, 1650 Btu. butane-air is used as a standby for 1100 Btu. natural gas. No specific gravity values are given for either gas. Since no mention is made of consumer complaints, it is implied that the substitute gas is satisfactory as a domestic fuel.

--M.F. Knoy

L P-GAS

CAMPBELL, JOHN. LIQUEFIED PETROLEUM GAS, THE SULFA DRUG OF THE GAS INDUSTRY; VERSATILITY OF LP-GAS AS A SUBSTITUTE FUEL. *Gas 21, 21-23, 1945 (Apr.)*

L P-GAS - APPLICATIONS

LADY, PAUL. DIESEL CONVERSIONS TO LP-GAS OPEN NEW AUTOMOTIVE FIELD. *Butane-Propane News 7, 72-80, 1945 (Apr.)*

MINERALS

PEHRSON, E.W. THE MINERAL POSITION OF THE UNITED STATES AND THE OUTLOOK FOR THE FUTURE. *Mining and Met. 26, 204-214, 1945 (Apr.)*

Our industrial and military power is largely attributable to our great mineral resources, the equal of which has not been developed in any other like area of the globe. But mineral deposits are exhaustible and the faster we grow the faster we liquidate the very basis of our power. Based on a comprehensive survey by the Geological Survey and the Bureau of Mines the results of which have not yet been published, Mr. Pehrson here gives the best authenticated estimates of the reserves of some of our most important minerals, and shows that in the years to come we must depend increasingly on foreign supplies. He discusses particularly, aspects involving national defense, peacetime supplies, tariffs and conservation.

--Editor's Abstract

MINES - AIR CONDITIONING

BAUMANN, A. AIR CONDITIONING OF MINES BY MEANS OF REFRIGERATORS INSTALLED UNDERGROUND. *Engineers' Digest 2, 134-136, 1945 (Mar.)* (Abridged from an article in *Brown Boveri review 30, 309-314, 1943 (Nov.-Dec.)*

This article discusses the possibility of cooling the atmosphere of deep mines by means of a cold air refrigerator, supercharged to the operating pressure of the compressed air tools and driven by a compressed air motor. The cold expanded air, discharged by this motor and the compressed air tools, is dried at the surface to prevent freezing by an air refrigerating machine of the "super-compression" type, and would supplement the effect of the cold air refrigerator.

--Author's abstract

Mine air conditioning is a specialized problem, since it offers a steady year around load, complicated by the necessity of removing a large amount of water from the shaft. The gas turbine-axial compressor combination is well adapted, according to the author of the article, to meeting the requirements of this service.

--J.I. Yellott

NATURAL GASOLINE

LOTT, F.S. AND SEELEY, E.M. NATURAL-GASOLINE PLANTS IN THE UNITED STATES. JANUARY 1, 1944. *U.S. Bureau of Mines. I.C. 7306, Jan. 1945*

A list of all natural gasoline plants, as of this date, listing capacity and status.

OIL SHALE

COOK, J.W., PERCY, N. AND ROBERTSON, J.M. THE COMPOSITION OF SCOTTISH SHALE OIL. PT. I.J. *Soc. Chem. Ind.* 64, 26-27, *1945 (Jan.)*

An examination of the wax fraction of Scottish shale oil has confirmed the presence of n-hentriacontane; this hydrocarbon was isolated in a pure state and an X-ray crystallographic comparison was made with a synthetic specimen.
--Author's abstract

ORGANIC SULFUR

GAS RESEARCH BOARD AND KEY, A. PROCESS FOR THE TREATMENT OF GASES PRODUCED BY THE CARBONIZATION OF COAL. *Brit. Patent 563,350, Nov. 24, 1942. (Abstracted in Gas World* 122, *59, 1945 (Jan. 20)*

An improved catalytic process is described for gas purification in which organic sulfur compounds present in water gas and coal gas are removed by conversion into hydrogen sulfide by reaction with hydrogen contained in the gas. It was found that certain constituents of coal gas, such as acetylene and other triple bonded hydrocarbons which poison the organic sulfur conversion catalyst, could be removed by catalytic hydrogenation prior to organic sulfur conversion.
Essentially, the process involves (1) removal of existing H_2S by the usual iron oxide purifier, (2) catalytic hydrogenation of unsaturates using molybdenum or nickel suflides at 300°C, (3) conversion of organic sulfur to H_2S by passing the gas at 300°C over oxides of chromium and copper, and (4) removal of converted H_2S by iron oxide purifier.
These catalysts also promote the combustion of hydrogen with any oxygen that may be present in the gas, yielding considerable heat which is used to maintain the catalyst at the desired temperature.
--E.A. Knaggs

TUTTLE, R.B. STRAIGHT-RUN GASOLINE DESULFURIZED CATALYTICALLY. *Oil and Gas Jl.* 43, *85-86, 1945 (Mar. 24)*

Description of a Perco bauxite desulfurization unit completed in June, 1944. Throughput of straight-run gasoline is 2000 bbl. per day. The working conditions are 50 psi and 800°F. Normal life cycle of the catalyst is between 2500 and 3000 bbl. per ton of bauxite. Catalyst is not regenerated, although 15-20 regeneration cycles are said to be possible. In a typical operation the sulfur content of a straight-run gasoline was reduced from 0.27 to 0.014%.
--C.H. Riesz

ORIFICES

YODER, D.M. SIMPLIFIED ORIFICE DESIGN FOR EXISTING PIPE LINES IN INDUSTRIAL PLANTS. *Instruments 18, 154, 1945 (Mar.)*

"A simplified orifice design formula which, although not the last word in accuracy, will be sufficiently accurate for most industrial purposes."
--Quotation from text.

PETROLEUM PRODUCTS

NATIONAL PETROLEUM NEWS. WARTIME AND POST-WAR PETROLEUM PRODUCTS. *80pp. Cleveland, N. P. N. 1945 $.75*

A series of 16 articles selected from recent issues of the Technical Section of National Petroleum News.

PETROLEUM REFINING

NATIONAL PETROLEUM NEWS. NEW REFINING PROCESSES. *64pp. Cleveland N.P.N., 1945. $.75*

A series of eighteen articles selected from recent issues of the Technical Section of National Petroleum News.

NATIONAL PETROLEUM NEWS. REFINERY DESIGN AND CONSTRUCTION. *64pp. Cleveland, N.P.N., 1945. $.75*

A series of twenty-two articles selected from recent issues of the Technical Section of National Petroleum News.

NATIONAL PETROLEUM NEWS. REFINERY OPERATION AND MAINTENANCE. *76pp. Cleveland, N.P.N., 1945. $.75*

A series of twenty-two articles selected from recent issues of the Technical Section of National Petroleum News.

NATIONAL PETROLEUM NEWS. REFRESHER ON WAR-TIME REFINING TECHNOLOGY. *135pp. Cleveland, N.P.N., 1945. $1.25*

Prepared by the editorial staff of the Technical Section of National Petroleum News from data in current literature, presenting a concise and coordinated review of wartime technological developments in all phases of petroleum refining.
--Publisher's statement.

PIPE LINES

GRANDONE, P. RECLAIMING USED PIPES FOR OIL-FIELD OPERATIONS WITH CEMENT LINING. *U.S. Bureau of Mines, I.C. 7314, 1945 (Mar.)*

PUMPS

OLIVER, G.D., BICKFORD, W.G., TODD, S.S. AND FYNN, P.J. GLASS-SURFACED MAGNETIC PUMP. *Ind. and Eng. Chem: Anal. Ed.* 17, 158-9, 1945 *(March)*

A magnetic pump with no exposed metal surfaces has been developed for the circulation of liquid at low pressures (as low as 10^{-6}mm.) A description of the pump and its accessories is presented.

--C.H. Riesz.

RESEARCH

FARR, W.K. ORGANIZED AND UNORGANIZED RESEARCH. *J. Chem. Ed.* 22, 140-43, 1945 *(Mar.)*

A general discussion of the development of research management principles, pointing out that individual research initiative must not be sacrificed to the organized research team.

—G.D. Creelman

RESEARCH, INDUSTRIAL

KING, J.G. RESEARCH IN INDUSTRY. *J. Inst. of Fuel: War Time Bull.* 18, 113-116, 1945 *(Feb.)*

A general discussion of the organization of research, both fundamental and applied, by industry, government and academic institutions.

TAYLOR, R.O. SMALL-SCALE RESEARCH. *Chem. Industries* 56, 395, 1945 *(Mar.)*

An editorial - A small company needs research even more than does a large one. Research under competent direction is a good investment. It is doubtful if a chemical manufacturer who cannot afford research can afford to be in the chemical business.

--G.D. Creelman

WILLIAMS, E.C. RESEARCH MANAGEMENT AND ITS RELATIONSHIP TO OTHER CHEMICAL COMPANY FUNCTIONS. *Chem. Industries* 56, 391-404, 1945 *(Mar.)*

"More and more of the top management jobs in chemical industry are being filled by chemists and chemical engineers who have come up through the ranks of research or other technical departments. Yet to be a good chemist or chemical engineer obviously it is not alone sufficient to make one a good manager. Some of the other requirements, and some of the objectives of technical management are discussed" in this authoritative review of the principles of research organization and coordination by one of the outstanding executives in this field.
Mr. Williams is Vice-President and Chemical Director of the General Aniline & Film Corporation.

--Publisher's abstract

RESEARCH, INDUSTRIAL - GAS

SEGELER, C.G. THE GAS INDUSTRY KEEPS PACE; AS ONE OF THE NATION'S PRIME ENERGY RESOURCES, GAS FUEL AND ITS DERIVATIVES HAVE ESTABLISHED AN IMPRESSIVE RECORD OF PUBLIC ACCEPTANCE OVER MANY YEARS. *A.G.A. Monthly* 27, 167-68, *1945 (Apr.)*

A brief review of research requirements of the Gas Industry with emphasis on research being done at the Institute of Gas Technology. (Mr. Segeler is Utilization engineer of the A.G.A.)

RESEARCH, INDUSTRIAL - GAS (DOMESTIC)

DOMESTIC GAS RESEARCH; ABSTRACTS OF PAPERS PREPARED FOR PRESENTATION BEFORE 1945'S CANCELLED CONVENTIONS. (AMERICAN GAS ASSOCIATION) *Gas.* 21, 31-32, *1945 (Apr.)*

These papers are being abstracted separately.

ROCKETS

LENT, C.P. ROCKET RESEARCH. *N.Y. Pen-Ink Publishing Co., 1945 (Book)*

This book, containing a few more than one hundred pages, is a very unusual compilation of hitherto unpublished work on rocket research. While much of the material included in the book is speculative, and many of the predictions border on the fantastic, it is of interest to the gas industry because of its presentation of material related to the production of extremely high temperatures, and very high rates of heat transfer. Much of the information on high temperature refractories, and other substances for experimental rockets, will be of interest to the designers of future gas appliances.

For one who is seeking new ideas, the book is worthy of careful reading. There is an index and a tabulation of the most important American and British rocket patents. Likewise, there is a brief bibliography and quite recent data on various flying bombs. Together with the recently published third edition of Geoffrey Smith's "Gas Turbines and Jet Propulsion" this book gives an up-to-date picture of the publishable information on rockets and related subjects.

—J.I. Yellott.

SMOKELESS FUEL

TOWARDS SMOKE ABATEMENT. *Coke & Smokeless-Fuel Age* 7, 49,50, *1945 (Mar.)*

The need for smokeless fuels is discussed with emphasis on the cost of pollution, the polluting constituents (smoke, ash, SO_2), and methods of solving the polluting problem.

—J.F. Schnacky

SPECTROGRAPHY

CLEVELAND, F.F. A METHOD FOR OBTAINING DEPOLARIZATION FACTORS OF RAMAN LINES, WITH RESULTS FOR CARBON TETRACHLORIDE AND TOLUENE. *Jl. of Chem. Physics* 13, *101-106, 1945 (Mar.)*

In the interpretation of Raman spectra, it is necessary to know how many lines are polarized and how many are depolarized. A method for obtaining

depolarization factors of Raman lines is presented and its precision tested by measurement of five different spectrograms of CCl_4.

--C.H. Riesz

SPECTROMETRY

BARNES, R.B., McDONALD, R.S., WILLIAMS, V.Z. AND KINNAIRD, R.F. SMALL PRISM INFRA-RED SPECTROMETRY. *J. Applied Phys.* 16, 77-86, *1945 (Feb.)*

The Perkin-Elmer infra-red spectrometer is described. Its limitations and application to industrial research is discussed. Whereas a medium-size room was required formerly, the present instrument can be housed on a 3x5 ft. floor space.

--C.H.Riesz

THERMAL DATA

WAGMAN, D.D. KILPATRICK, J.E., TAYLOR, W.J., PITZER, K.S. AND ROSSINI, F.D. HEATS, FREE ENERGIES AND EQUILIBRIUM CONSTANTS OF SOME REACTIONS INVOLVING O_2, H_2, H_2O, C, CO, CO_2, and CH_4. *J. of Research of National Bur. Standards.* 34, *143-161, 1945 (Feb.)*

Presents values for the thermodynamic properties of O_2, H_2, H_2O, CO, CO_2, N_2, and CH_4 in the perfect gas state, and for solid carbon in the states of graphite and diamond, as well as the heats of reaction, free energies of reaction and equilibrium constants for the fundamental reactions of gasification of carbon, combustion of CO, the water gas equilibrium and the production of H_2, by reaction of CH_4 with O_2, CO_2 and H_2O, all as functions of temperature. This work was a joint enterprise of the Thermochemical Laboratory of the Bureau of Standards and the A.P.I. research project on the properties of hydrocarbons. While the work was done because the results are important in connection with the production of liquid hydrocarbons from natural gas or from coal and H_2, the data will be useful also in connection with the gasification of coal, coke and liquid hydrocarbons from natural gas or from coal and H_2, the data will be useful also in connection with gasification of coal, coke and liquid hydrocarbons, as well as the synthesis of CH_4 from CO and H_2.

—B. Miller

VENTILATION - KITCHEN

OURUSOFF, L. AND GREGG, R.C. REVIEW OF RESEARCH IN KITCHEN VENTILATION. *Gas Age* 95, *29-31, 1945 (Mar. 22); Butane-Propane News* 7, *35-49, 1945 (May)*

Three types of hoods have been studied under various conditions. These were the cabinet type, modified wall type and full canopy type hood. Efficiency of heat removal from the kitchen was determined from the quantity of air discharged, and the temperature rise in the exhaust duct above the average room temperature. Comparative efficiencies of the three types are given in the form of "air withdrawal rate vs. heat removed" graphs.

--H. Inatomi

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List of Periodicals Received

A.A.A.S. BULLETIN
ALLIS CHALMERS ELECTRICAL REVIEW
AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS: BULLETIN
AMERICAN CHEMICAL SOCIETY: JOURNAL
AMERICAN GAS ASSOCIATION: MONTHLY
AMERICAN GAS JOURNAL
AMERICAN INSTITUTE OF CHEMICAL ENGINEERS: TRANSACTIONS
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